

FOSS

Pebbles, Sand, and Silt

Concept and Lesson Map



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FOSS Concept and Lesson Map: Pebbles, Sand, and Silt

The Big Picture

Students begin by noticing the many properties of rocks and sorting them by those properties. Then they look at rocks in terms of size and how size makes rock suitable for specific uses. Students then explore soil, focussing on the parts that make up soil.

Eliciting Student Ideas

Goal: Uncovering student ideas about water.

Use “new” assessment, given pre-and post-instruction that assesses each of the “big ideas”

Investigation 1: First Rocks

Goal: Rocks have a variety of properties and can be sorted according to these properties.

Part 1: Three Rocks

Observe different properties of rocks by rubbing, washing, and sorting them.

IQ1: How are rocks different?
IQ2: What happens when rocks rub together?

Part 2:

Washing Three Rocks

Washing rocks to uncover more properties for observation.

IQ: What new properties are seen when rocks are washed?

Part 3

First Sorting

To sort and group based on similar properties using one property at a time.

IQ: How are some rocks the same?

Part 4

Sorting Games

Use sorting mats to play sorting games practicing observation skills.

IQ: How many ways can rocks be sorted and grouped?

Part 5

Start a Rock Collection

Organize a classroom rock collection to explore properties of a more varied group of rocks.

IQ: What rocks can we find around us, and how can we group them?

Investigation 2: River Rocks

Goal: Rocks can be categorized in different sizes.

Part 1

Screening River Rocks

Use a set of screens to separate a rock mixture into different sizes drawing students’ attention to varied sizes of rock.

IQ: How can rocks be sorted by size?

Part 2

River Rocks by Size

Group rocks based on size using hands as tools; subdividing into the categories of sand, gravel, and pebble.

IQ: How else can rocks be sorted by size?

Part 3

Sand and Silt

Separate sand and silt using water in a vial to find sizes too small to sort with hands and screens.

IQ: Is there an Earth material smaller than sand?

Part 4

Exploring Clay

Separate an even smaller rock particle clay using the procedure used to separate silt.

IQ: Is there an Earth material smaller than silt?

Investigation 3: Using Rocks

Goal: Properties of rocks make them suitable for specific uses.

Part 1

Rocks in use

Walk through the neighborhood looking for how Earth materials are being used.

IQ: How do people use rocks?

Part 2

Looking at Sandpaper

Compare different grades of sandpaper to look for similarities with loose sand.

IQ: What does sand do for sandpaper?

Part 6

Other uses

Use the picture gallery to explore a quarry and then observed rocks in use.

IQ: What are other uses for Earth materials?

Part 7

Finding Rocks

Find examples of Earth materials in use on the FOSS website interactive for Pebbles, Sand, and Silt.

IQ: How are rocks used?

Parts 3,4, and 5 have been replaced by Parts 6 and 7.

Investigation 4: Soil Explorations

Goal: Soil is made up of many parts. The “ingredients” are the same, but the quantities differ from soil to soil.

Part 1

Homemade Soil

Mix a recipe of homemade soil using humus, sand, gravel and small pebbles.

IQ: What is in dirt?

Part 2

Soil Search

Find and collect soil samples in the neighborhood to examine and compare in Part 3.

IQ: Are all soils the same?

Part 3

Studying Local Soil

Inquiry project comparing local soil samples collected in Part 2 with the homemade soil made in Part 1.

IQ: How do soils differ?

Conduct “perc test” as a class rather than as homework after part 3

Further Reflections

Goal: Provide opportunities for reflection on learning about water.

Use “new” assessment, given pre-and post-instruction that assesses each of the “big ideas”